TOP SECRET

TCS-1031-63/KH
21 January 1963
TID/TAB-13/63

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MEMORANDUM FOR: Chief, Technical Intelligence Division

SUBJECT: Requirement for Binary Reader

STATEMENT OF THE PROBLEM:

NPIC has a requirement for a universal binary reader to assure prompt and reliable time readout for technical processing.

ASSUMPTIONS:

1. It is assumed that the accurate time for each exposure taken in orbit will be, and necessarily so, a very early imput into the Univac 490 computer in order to realize the full benefits of real-time service.

2. It is assumed that the many future satellite reconnaissance systems will have binary time registered on the film, and that the format or the pattern of the images will not be standardized.

3. It is assumed that it will be some time, if ever, before the failure of binary lights will be completely corrected and that other errors that have been experienced will be non-existent.

FACTS:

1. The present binary reader in CSD/ADPB has only one format and is not completely reliable.

2. Correcting the many errors that are possible in order to have accurate time for each exposure is complicated and time consuming.

3. The binary reader in ADPB combined with the 1401 data processor detects some errors but does not correct them.

4. It is necessary for the success of the real-time concept, that the accurate time of each exposure be made available as a Univac 490 input as early as possible.

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DISCUSSION OF THE FACTS:

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1. The present binary reader in NPIC cannot handle a variety of formats or binary image patterns, or for that matter, can the reader at [redacted]. The NPIC reader was made specifically for the KH-4 system and fabricated by NPIC personnel. The present reader has made a considerable number of errors attributable to the reader alone. The above is not a derogatory statement, the efforts imparted by ADPB/CSD personnel have been noted and appreciated.

2. Many errors can and do occur with binary light patterns, among these are:

a. Light failures, i.e. either the lights go on and stay on, or go out and stay out, or are intermittent and random.

b. Crossed wires, i.e. light ten goes on when light eight should etc.

c. Dim light, i.e. lights of variable density.

d. Light leaks, etc.

Correcting these errors has been extremely tedious as well as time consuming because of the complicated logic that is involved.

3. The output of the present binary reader at NPIC when fed into the 1401 data processor results in an output - that detects large errors but does not correct them. The limits, imposed by the variations in camera cycle time prohibits detection of smaller errors. Admittedly it is a great assistance to have the detection of large errors available but the tediousness involved in making the corrections is imposing production delays. What is needed is a computer program for the Univac 490 that will attempt to detect and correct to the five millisecond interrogation interval.

4. One of the first inputs into the Univac 490 must be the correct-time correlated to each exposure. The early input of accurate time is what will make the real-time system operable at an early stage of exploitation. Additionally TID/TAB has need for early accurate time data in the solution of its production problems.

RECOMMENDATION:

1. It is recommended that Chief P & DS negotiate for a binary reader that will have the following general characteristics.

a. The ability to change the format or pattern of the binary bit sensors.

b. That the sensors be able to detect in some manner dim as well as bright images, i.e. that the density sensitivity of the sensors be variable for each bit position.

c. The capability for redundant recording of binary images plus output correlation to assure that reader errors are eliminated or reduced to a minimum.

CONCLUSION:

It is concluded that in order to be prepared, on a timely basis, for any type of satellite output, that NPIC obtain a universal binary reader as expeditiously as possible.

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[redacted]
Chief, Technical Analysis Branch

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NPIC/TID/TAB [redacted] met

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